

5.10 TRANSPORTATION

5.10.1 Alternative 1 – No Action

If Alternative 1 were selected, there would be no increase in vehicular traffic, vehicular emissions, or transportation risk as compared to the current conditions.

5.10.2 Alternative 2 – Remodel

There would be negligible increases in traffic during remodeling, deactivation, and demolition activities at the ORNL due to workers commuting to ORNL for these activities. Interruption of traffic would not be expected due to activities under Alternative 2. The remodeling activities would be temporary and would not result in long-term effects.

5.10.3 Alternative 3 – Brownfield

The Preferred Alternative includes the transportation of chemicals, office supplies, and equipment from the Y-12 National Security Complex to ORNL. Potential effects resulting from the transport of materials from Y-12 to ORNL would be negligible as the two areas are located within close proximity to one another.

As with Alternative 2, there would be minimal increase in traffic during remodeling and construction activities at the ORNL if Alternative 3 were implemented. Traffic interruptions would not be expected due to remodeling and construction activities. The remodeling and construction activities would be temporary and would not result in long-term effects. There would be a marginal increase in employee traffic to the ORNL along Bethel Valley Road after approximately the 540 total employees at Y-12 (340) and other off-site buildings (200) were moved to ORNL facilities. This increase in the employee traffic to ORNL would be offset by decreases in the total employees at ORR in recent years (Section 4.10).

A traffic flow and parking study is being conducted to determine the appropriate changes in parking lot locations and access for ORNL staff for the potential new construction. In both the Brownfield and

Greenfield alternatives, the areas planned for new parking are of sufficient size to accommodate the transfer of staff from Y-12 and the employees that would work in the new facilities during the next ten years. New entrance and exit points at a variety of locations around the perimeter of the Laboratory could be utilized to promote an “open campus” approach at ORNL. Options to be considered for traffic calming along Bethal Valley Road include: incorporation of traffic islands, lane additional/squeezing, speed limits and additional lights. Final decisions would make traffic safety the highest priority.

Miscellaneous chemicals including organics, inorganics, and certain biological materials used for R&D purposes would be required to meet the DOT Hazardous Materials Regulations (Title 49, CFR, Parts 171-180) governing packaging and shipping of hazardous materials when transported from Y-12 buildings to new ORNL buildings.

The transportation of chemicals, office supplies, and equipment which is estimated to be approximately 7100 m³ (250,000 ft³) (Skipper 2000a) would be transported by truck from the Y-12 National Security Complex to the ORNL. The approximate distance between the Y-12 National Security Complex and ORNL is 13 km (8 mi). Assuming a 26 x 9 x 8 ft truck is used, approximately 23 m³ (800 ft³) of material would be transported in one trip. Therefore, the total number of trips to transport the material from the Y-12 National Security Complex to ORNL would be approximately 313. The potential effects due to transportation during relocations activities would be negligible as described below.

5.10.3.1 *Risks Due to Emission from Vehicles and Accidents*

The transfer of materials from the Y-12 National Security Complex to ORNL by truck would involve risks due to VOC emissions from vehicle (vehicle-related health risks) and vehicle accidents (vehicle-related accident risks).

Vehicle-related health risks resulting from routine transportation may be associated with the generation of air pollutants by transportation vehicles during material shipments. A risk factor for inhalation of vehicular exhaust (1.6×10^{-7} per mile of truck travel) (DOE 2000d) was used to estimate cancer fatalities that might

result from the number of miles traveled as part of the FRP. Based on an anticipated total mileage of 15,000 over a ten year period (5,000 miles for the transportation of chemicals, office supplies, and equipment and 10,000 miles for additional mobility of employees, construction workers, and heavy equipment), the total excess latent mortality was estimated as 2.4×10^{-3} . The risk is based on the vehicular emissions and is independent of the type of material being transported.

Vehicle-related accident risk refers to the potential for transportation-related road accidents that directly result in injuries or fatalities. The risk represents an estimate of the number of injuries and fatalities from mechanical causes. In a study of risks from 1994 through 1998, there were 1.7 deaths for motor vehicles [equivalent to 1 per 96.5 million km (60 million mi)] and 2.8 deaths for large trucks per [160.9 million vehicular km (100 million vehicular mi)]. There were 0.14 fatalities per million shipments of all types of hazardous materials transportation (DOT 1999). Since it is likely that implementation of either Alternative 3 or 4 would result in less than 24,140 km (15,000 mi) of vehicular traffic for relocation, remodeling, and construction activities combined, the risks attributable to an accident would be negligible.

5.10.3.2 *Effects to Air Quality from Transportation*

Ozone (criteria pollutant) is considered here to evaluate the potential effects to air quality that could result from implementation of Alternative 3 or 4 because it is possible that the use of an 8-hr standard (revoked in May 2000) for ground-level ozone would result in designation Knox, Anderson, Blount, and Sevier Counties as non-attainment areas based on historical air monitoring data (TDEC 2000). The EPA threshold for ozone (measured by its precursor, NO_x for “ozone attainment areas outside the ozone transport region”) is 200,000 lb/year (100 tons/year). Emission factors for ozone (O_3) for various motor vehicle types have been modeled for the year 1990 (Goel 1991). The emission factor for heavy duty diesel-powered vehicles (HDDVs) for NO_x (an ozone precursor) is 86.8 L/m (22.9 g/mi).

Assuming a bounding case of 24,140 km (15,000 mi) of truck travel in one year, approximately 345 kg (760 lbs) of O_3 would be generated in one year. This amount of emission is minimal and is well below the threshold standard of 100 tons/year and thus requires no formal conformity analysis.

5.10.4 Alternative 4 – Greenfield

The potential effects of implementing Alternative 4 with respect to transportation would be similar to the effects resulting from Alternative 3 discussed above. The Greenfield Site is within the same area as the Brownfield Site. More heavy equipment usage would occur during site preparation activities under Alternative 4. This would result in somewhat higher emissions levels on a temporary basis. No other differences would be anticipated.